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| 09/801,897      | 03/09/2001  | Naoshi Matsuo        | 010280              | 2593             |

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| EXAMINER |
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MICHALSKI, JUSTIN I

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| ART UNIT | PAPER NUMBER |
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2644

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/801,897

**Applicant(s)**

MATSUO, NAOSHI

**Examiner**

Justin Michalski

**Art Unit**

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some \* c) ☐ None of:

- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 14 July 2004 have been fully considered but they are not persuasive. Applicant argues on page 10, lines 6-11;

"Shields discloses an acoustic transducer system including a plurality of individual transflexural piezoelectric elements potted in a plastic or rubber compound.

Fig. 4 of Shields shows the piezoelectric elements each contained entirely within the 'plastic or rubber compound' forming the diaphragm. This is in contrast to the present invention, in which the transducers are attached to an outer surface of the diaphragm, as shown in Fig 1."

The office respectfully disagrees with this argument since, "the transducers are attached to an outer surface of the diaphragm", as argued, is not found in amended independent claims 2 or 14.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2-5, 8 and 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shields as applied to claim 1 above in view of Katsumi et al. (Japanese Patent Publication 3-159500).

Regarding Claims 2 and 14, Shields discloses a speaker apparatus comprising (Figure 4): a transducer (transducers 1) for transducing an input electric signal into mechanical vibration; and a single diaphragm (flexible layer 12, i.e. flat panel) for converting the mechanical vibration into a sound signal; wherein said single diaphragm is provided with a plurality of the transducers (transducers 1), and the single diaphragm is provided with a plurality of independent signal control points (Shields discloses phasing the array of transducers, i.e. control points) corresponding to the respective transducers. Shields further discloses an array of piezoelectric transducers and discloses a method of phasing the array (i.e. causing interference by delaying the sound signal from one transducer to another) to adjust the transmission of sound (Column 3, lines 62-64). Shields does not disclose being able to stereophonically reproduce a plurality of channels by the single diaphragm. Katsumi et al. discloses (Figure 2) an array of speakers along with delay elements (6) and a delay amount controller (7). Katsumi et al. further discloses controlling the delay quantity of the sound waves from each of the speakers (i.e. transducers) several image sound sources can be produced (i.e. stereophonically in order to produce a sound image) (Abstract and Constitution). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method of phasing the array as disclosed by Shields with the method of delay as taught by Katsumi et al. in order to create a stereophonic signal from a diaphragm and increase feeling for the sound image being made.

Regarding Claim 3, Shields further discloses an array of piezoelectric transducers and discloses a method of phasing the array (i.e. causing interference by delaying the sound signal from one transducer to another) to adjust the transmission of sound (Column 3, lines 62-64). Shields does not disclose causing an interference between signal outputs from the plurality of the signal control points so as to localize a sound image in an arbitrary point. Katsumi et al. further discloses (Figure 2) an array of speakers along with delay elements (6) and a delay amount controller (7). Katsumi et al. discloses that the delay elements and controller can be used to generate a focus point of plural sound waves and to shift the position of the focus point. Making it possible to make plural moving sound images. (IDS partial translation, Page 3 (685) top left col. Lines 1-19).

Regarding Claim 4, Shields further discloses wherein the interference sound signal includes information for controlling a sound pressure distribution so as to control directionality of the sound image (Shields discloses phasing (i.e. controlling sound pressure distribution) the array to focus (i.e. control directionality) the beam at a specified volume) (Column 3, lines 62-64).

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Regarding Claim 5, Katsumi et al. further discloses delay elements 6 and controller 7 which adjust the phases (i.e. frequency) of the sound waves from each of the speakers at the position 8 (i.e. listening position) to create a sound image (Abstract and constitution).

Regarding Claim 8, Shields further discloses the diaphragm (figures 3 and 4, layer 12) extends over an entire surface of a desired speaker array (1). Katsumi et al.

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further discloses delay elements 6 and controller 7 are used to control the phases of the sound waves to produce a image for a listener at position 8 which are produced and transmitted by localized speakers (i.e. transducers 5).

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shields as modified as applied to claim 3 above, and further in view of lida et al. (US Patent 5,579,396). Shields as modified discloses an apparatus as stated apropos of claim 3 above but does not disclose surround stereo system. lida et al. discloses a speaker apparatus (Figure 19) where an image to be localized can be arranged around a listener to achieve a surround stereo system (Column 1, lines 6-14). lida et al. further discloses that sound images can be localized at positions LB and RB (i.e. signal control points) (Column 24, lines 13-19). It is well known in the art and would have been obvious to one of ordinary skill in the art at the time the invention was made to include a left and right rear transducer in order to produce a surround stereo system to localize sounds around a listener as disclosed by lida et al.

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5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shields as modified as applied to claim 3 above, and further in view of lida et al. (US Patent 5,579,396). Shields as modified discloses an apparatus as stated apropos of claim 3 including a diaphragm which extends over an entire surface of a desired speaker array. Shields as modified does not disclose the sound images are localized in positions of the signal control points of the desired speaker array. lida et al. discloses a speaker

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apparatus (Figure 19) including a speaker array (LF, RF, LB, RB). lida et al. discloses that sound images can be localized at positions LB and RB (i.e. signal control points) (Column 24, lines 13-19). lida et al. further discloses the apparatus can produce an image to be localized can be arranged around a listener to achieve a surround stereo system (Column 1, lines 6-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the sound images to be localized in positions of the signal control points in order to produce an image to be localized to achieve a stereo audio effect as disclosed by lida et al.

6. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shields as modified as applied to claim 3 above, and further in view of Haruo (Japanese Patent Publication 61-61598).

Regarding Claim 9, Shields as modified discloses a speaker apparatus as stated apropos of claim 3 above but does not disclose transducers being arranged in a peripheral portion of the diaphragm. Haruo discloses an acoustic device comprising a diaphragm (7) and transducer elements (3 and 4). Figure of Haruo discloses transducer elements (3 and 4) arranged in a peripheral portion of the diaphragm (7). Haruo further discloses that the transducer elements can be adhered on the front panel with an adhesive (Abstract and constitution). Therefore, it would have been obvious to one of ordinary skill at the time the invention was made that transducers can be arranged in a peripheral portion of a diaphragm in order to control the placement of the transducers on the diaphragm as disclosed by Haruo.

Regarding Claim 10, Haruo further discloses the diaphragm being formed of a transparent material (Haruo discloses diaphragm is a cathode ray tube which is inherently a transparent material) (Abstract).

Regarding Claim 11, Haruo further discloses the diaphragm is a cathode ray tube which is well known in the art to be used as a monitor display.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shields as modified as applied to claim 11 above, and further in view of Wolfe (US Patent 5,521,765). Shields as modified discloses a speaker apparatus along with a cathode ray tube as stated apropos of claim 11 above but does not disclose the transparent material reducing a reflection of light and blocking electromagnetic waves. Wolfe discloses a filter to reduce glare (i.e. reflection) of a cathode ray tube and enhance the image contrast (Column 1, lines 9-12). Wolfe further discloses the filter attenuating light (i.e. blocking electromagnetic waves) from the video image as it is transmitted out of the screen to improve the contrast of the picture (Column 1, lines 20-24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a filter on the cathode ray tube as disclosed by Shields as modified in order to reduce glare and improve contrast as taught by Wolfe.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shields as applied to claim 2 above in view of Hornsari et al. (Japanese Patent Publication 9-212270). Shields as modified discloses a speaker apparatus as stated apropos of claim



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2 including being made of piezoelectric elements (Column 1, line 18). Hornsari et al. discloses a computer keyboard comprising speakers 26a and 26b. Hornsari et al. further discloses the speakers can be of a piezoelectric type and used to generate stereo sound directly from the keyboard (IDS partial translation, Page 3 col.4 lines 20-45). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the a speaker apparatus could be integrated with a keyboard as disclosed by Hornsari et al. to generate stereo sound directly from the keyboard to the user.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (703)305-5598. The examiner can normally be reached on 8 Hours, 5 day/week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JIM

  
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PRIMARY EXAMINER